

CLAIMS

What is claimed is:

1. A system comprising:
a home node that receives a first request for data from a first node according to a first cache coherency protocol and provides a second request for the data based on the first request; and
a second node that provides a conflict response to the second request, the conflict response indicating that an ordering point for the data is migrating according to a second cache coherency protocol, which is different from the first cache coherency protocol.
2. The system of claim 1, wherein the home node provides a retry request associated with the second request for the data in response to the conflict response from the second node.
3. The system of claim 2, wherein, in response to the retry request associated with the second request, the home node and the first node each receives a response that includes a copy of the data which completes the request for the data from the first node according to the first cache coherency protocol.
4. The system of claim 1, wherein second node has a transition state associated with the data in response to sending an ownership data response to a third node, the second node providing the ownership data response to a source broadcast request provided by the third node according to the second cache coherency protocol.
5. The system of claim 4, wherein the second node comprises a processor having an associated cache that comprises a plurality of cache lines, one of the cache lines of the associated cache containing the data in the transition state.
6. The system of claim 4, wherein the third node transitions to a second state associated with the data in response to receiving the ownership data response from the second node, the second state defining the first node as a new cache ordering point for the data.

7. The system of claim 6, wherein the third node provides an acknowledgment signal to the second node, the second node transitions from the transition state to an invalid state in response to receiving the acknowledgement signal.
8. The system of claim 1, wherein the first cache coherency protocol comprises a forward progress cache coherency protocol.
9. The system of claim 8, wherein the forward progress protocol comprises one of a null-directory cache coherency protocol and a directory-based cache coherency protocol.
10. The system of claim 8, wherein the second cache coherency protocol comprises a source broadcast cache coherency protocol.
11. The system of claim 1, wherein each of the first and second nodes comprises a respective processor having an associated cache that comprises a plurality of cache lines, each of the first and second nodes being programmed to facilitate interaction between the first protocol and the second protocol during migration of the ordering point from the cache of the second node to the cache of the first node.
12. A multi-processor computer system comprising:
a home node provides at least one snoop to obtain a copy of a line of data in response to a request provided by a first processor in a forward progress protocol, the home node reissues the at least one snoop when another copy of the line of data exists in the system associated with a broadcast-based protocol and no copy of the line of data is returned in response to the request provided by the first processor in the forward progress protocol, the another copy of the line of data being at least as up-to-date as the line of data in memory associated with the home node.
13. The system of claim 12, further comprising a second processor having an associated cache that includes the line of data in a cache line having a state indicative of migration of a cache ordering point for the line of data from the second processor to a third processor according to the broadcast-based protocol.

14. The system of claim 13, wherein the second processor transitions the cache line thereof to the associated state in response to providing an ownership data response to a source broadcast request issued by the third processor in the broadcast-based protocol.
15. The system of claim 13, wherein the second processor provides a conflict response to the home node in response to the at least one snoop provided by the home node, the home node reissues the at least one snoop based at least in part on the conflict response.
16. The system of claim 12, wherein the forward progress protocol comprises one of a null-directory cache coherency protocol and a directory-based cache coherency protocol.
17. The system of claim 12, wherein each of the home node and the first processor receives a response that includes a copy of the line of data to complete the request provided by the first processor in the forward progress protocol.
18. The system of claim 12, wherein the home node sets a conflict condition based on at least one of receiving a request for the line of data provided by another node according to the broadcast-based protocol and receiving a conflict response to the home node provided in response to the at least one snoop provided by the home node, the home node reissuing the at least one snoop in response to setting the conflict condition.

19. A multi-processor computer system, comprising:
- a first processor that provides a first request for data to a home node employing a forward progress cache coherency protocol;
 - the home node provides a snoop request for the data to at least a second processor and to an owner processor based on the first request;
 - the second processor provides a miss response to the snoop request, and thereafter provides a source broadcast request for the data employing a broadcast-based cache coherency protocol; and
 - the owner processor comprises an associated cache that includes the data in a cache line having a first state that defines the owner processor as an ordering point for the data, the owner processor receives the source broadcast request prior to the snoop request from the home node, the owner processor providing an ownership data response to the source broadcast request and transitioning from the first state to a transition state associated with the data, the owner processor providing a conflict response to the home node in response to receiving the snoop request while having the transition state associated with the data, the home node reissues the snoop request for the data in response to the conflict response from the owner processor.
20. The system of claim 19, wherein the second processor transitions to a second state in response to receiving the ownership data response from the owner processor, the second state defining the second processor node as a new cache ordering point for the data.
21. The system of claim 20, wherein the second processor provides an acknowledgment signal to the owner processor, the owner processor transitions from the transition state to an invalid state in response to receiving the acknowledgement signal.
22. The system of claim 20, wherein, in response to the snoop request reissued by the home node, the second processor provides a response to each of the home node and the first processor that includes a copy of the data to complete the first request for the data.
23. The system of claim 19, wherein the owner processor further comprises a cache having a plurality of cache lines, one of the plurality of cache lines containing the data in the transition state.

24. The system of claim 19, wherein the forward progress cache coherency protocol comprises one of a null-directory cache coherency protocol and a directory-based cache coherency protocol.

25. A system, comprising:

means for transitioning a cache state for data at a first processor node from an ownership state to a transition state associated with migration of an ordering point for the data from the first processor node in response to a request for the data according to a first cache coherency protocol;

means for issuing a first snoop from a home node to request the data from at least the first processor node according to a second cache coherency protocol, the second cache coherency protocol being different from the first cache coherency protocol; and

means for issuing a second snoop from the home node to request the data from at least the first processor node in response to setting a conflict condition at the home node based on responses to the first snoop received at the home node.

26. The system of claim 25, wherein the request for the data in a first cache coherency protocol is provided by a second processor node, the second processor node providing a miss response to the first snoop to the home node, the second processor node also providing a response to the second snoop to the home node and to a third processor node, the response to the second snoop including a copy of the data.

27. The system of claim 26, further comprising means for providing a request for the data from the third processor node to the home node according to the second cache coherency protocol, the first snoop and the second snoop being issued by the home node in response to the request for the data from the third processor node.

28. The system of claim 26, further comprising means for providing a migration acknowledgment signal to acknowledge receipt at the second processor node of an ownership data response provided by the first processor node and for transitioning to a cache state at the second processor node that defines the second processor node as a new cache ordering point for the data.

29. The system of claim 25, wherein the first cache coherency protocol comprises a source broadcast cache coherency protocol.
30. The system of claim 29, wherein the second cache coherency protocol comprises one of a null-directory cache coherency protocol and a directory-based cache coherency protocol.
31. A method comprising:
 providing a snoop request for data from a home node in response to a request for the data according to a forward progress protocol; and
 reissuing the snoop request from the home node in response to receiving a response at the home node associated with migration of an ordering point from a cache of a first processor.
32. The method of claim 31, further comprising providing a source broadcast request to the first processor for the data according to a broadcast-based protocol, the ordering point migrating in response to the source broadcast request for the data.
33. The method of claim 32, further comprising:
 providing an ownership data response from the first processor in response to the source broadcast request for the data; and
 transitioning a state associated with the data at the first processor from an owner state to a transition state associated with the migration of the ordering point.
34. The method of claim 33, further comprising transitioning a state associated with the data at a second processor that provided the source broadcast request for the data in response to receiving the ownership data response, the second state defining the second processor as a new cache ordering point.
35. The method of claim 34, further comprising providing a response from the second processor to the reissued snoop request that includes a copy of the data, the response to the reissued snoop request being provided to the home node and to a third processor that provided the request for the data according to the forward progress protocol.